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CUTANEOUS SARCOID-LIKE REACTION ON TATTOOED SKIN AFTER RECOVERY FROM CORONAVIRUS DISEASE 2019

Dear Editor:

The dermatologic manifestations of COVID-19 are complex and incompletely understood. According to the American Academy of Dermatology's COVID-19 registry, the most commonly reported cutaneous findings include morbilliform rash, pernio-like acral lesions, urticaria, macular erythema, vesicular eruption, papulosquamous eruption, and retiform purpura.[1] Here, we describe a patient with recurrent cutaneous sarcoid-like reaction within a tattoo whose most recent flare occurred in the setting of prior COVID-19 infection.

A 42-year-old male patient presented with a three-week history of raised, mildly pruritic papules and nodules within the black ink of his extensive tattoos and an asymptomatic nodule within non-tattooed skin of the right forehead. The patient's history was significant for a COVID-19 diagnosis four months prior, with mild respiratory and flu-like symptoms lasting for five weeks after diagnosis, suggesting an extended period of illness.

The patient had a similar episode of granulomatous skin reaction occurring three years prior at an outside facility, which resolved with a prednisone taper. He was seen in our clinic approximately one year later with another flare, at which time he was treated with topical triamcinolone 0.1% ointment twice daily, and a 15-day prednisone taper. A biopsy of the forehead and right arm was taken at that time, revealing non-caseating granulomas throughout the dermis with sparse lymphocytic infiltrate (Figure 1). Acid-fast bacilli, Fite, and Grocott's Methenamine Silver stains were negative. A chest x-ray obtained during this time period was negative for an acute cardiopulmonary process. The patient was then lost to follow-up until his current presentation.

On examination, firm linear nodules and firm papules were visible within the black ink of tattoos on the bilateral arms, bilateral legs, chest, and back (Figure 2). The right forehead showed an erythematous firm nodule with prior biopsy site changes. The remainder of the physical examination was unremarkable, and the patient did not report any systemic symptoms. Serum angiotensin-converting enzyme levels and a repeat chest x-ray were unremarkable.

The patient was treated with a 15-day prednisone taper with incomplete resolution and flaring upon completion. He was then started on hydroxychloroquine 200mg oral twice daily, topical triamcinolone 0.1% ointment twice daily for two weeks, and an injection of 0.1mL of 5mg/mL intralesional triamcinolone to the right forehead lesion. He had initial resolution of the forehead nodule with intralesional therapy and 100-percent resolution of papules and nodules within his tattoos after three months of hydroxychloroquine therapy.

We report a novel case of a recurrent cutaneous sarcoid-like reaction within a tattoo in the setting of recent COVID-19 infection. While our patient had prior episodes with the same presentation, his disease was quiescent for two years until he recovered from a long but mild illness due to COVID-19, suggesting the immune insult from this viral infection might have triggered his recurrence. Development of a sarcoid-like cutaneous reaction has been reported previously in a patient convalescing from COVID-19 pneumonia who had no prior history of the cutaneous eruption.[2] It has also been postulated that COVID-19 and sarcoidosis share certain common pathways, including angiotensin-converting enzyme-2

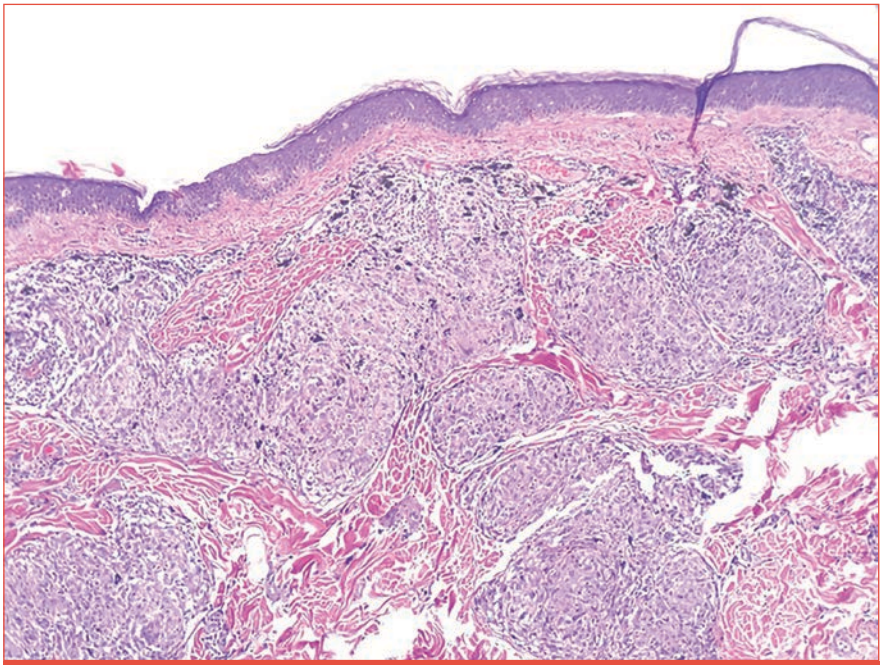

FIGURE 1. Punch biopsy from the right arm showed a superficial and deep granulomatous dermatitis composed of non-caseating granulomas with tattoo ink throughout the dermis (Hematoxylin-eosin stain, 10x)

FIGURE 2. Photo of left arm tattoos with arrow pointing to a representative area of induration within black ink

receptor downregulation and dysregulation of macroautophagy.[2,3] As suggested by Behbahani et al,[2] sarcoid-like reactions in COVID-19 patients could be a sign of disease convalescence.

Although the immunologic features of COVID-19 are not completely understood, a prominent feature of infection is transient lymphopenia, which might involve both CD4+ and CD8+ T-cell subsets.[4] Several models of T-cell responses during COVID-19 progression have been described, which can differ depending on disease severity.[4] Determining how lymphopenia in patients with COVID-19 impacts T-cell hyperactivation and potential immunopathology is an active area of investigation, and it is currently unknown how it may influence cutaneous sarcoidosis.[4]

Given the relationship between the patient's sarcoidosis flare and COVID-19 disease remission, we postulate the granulomatous inflammation might have been incited by the recovery of CD4+ T-lymphocytes. A similar phenomenon has been demonstrated in HIV-positive patients with sarcoidosis who begin treatment with highly active anti-retroviral therapy (HAART).[5] A case series by Lenner et al[5] describes the recurrence of pulmonary sarcoidosis in HIV-infected patients who were successfully treated with HAART. The authors conclude that immunologic reconstitution and inhibition of viral replication might cause exacerbation of other lymphocyte-dependent disease, including sarcoid-like pulmonary granulomatous disease.[5]

The development of cutaneous granulomatous lesions within tattoos has been well established, but triggers for recurrence are incompletely understood. We postulate that the mechanism outlined above might have contributed to the recurrence of a sarcoid-like cutaneous eruption within a tattoo.

With regard,

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